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PRELIMINARY EXAMINATION

OF

INLAND WATERWAY

FROM

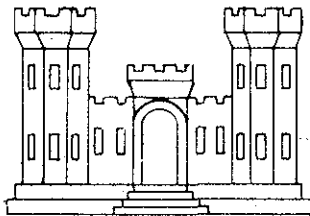
PORTLAND ME., TO BOSTON, MASS.

AND FROM

PLUM ISLAND SOUND

TO ANNISQUAM RIVER

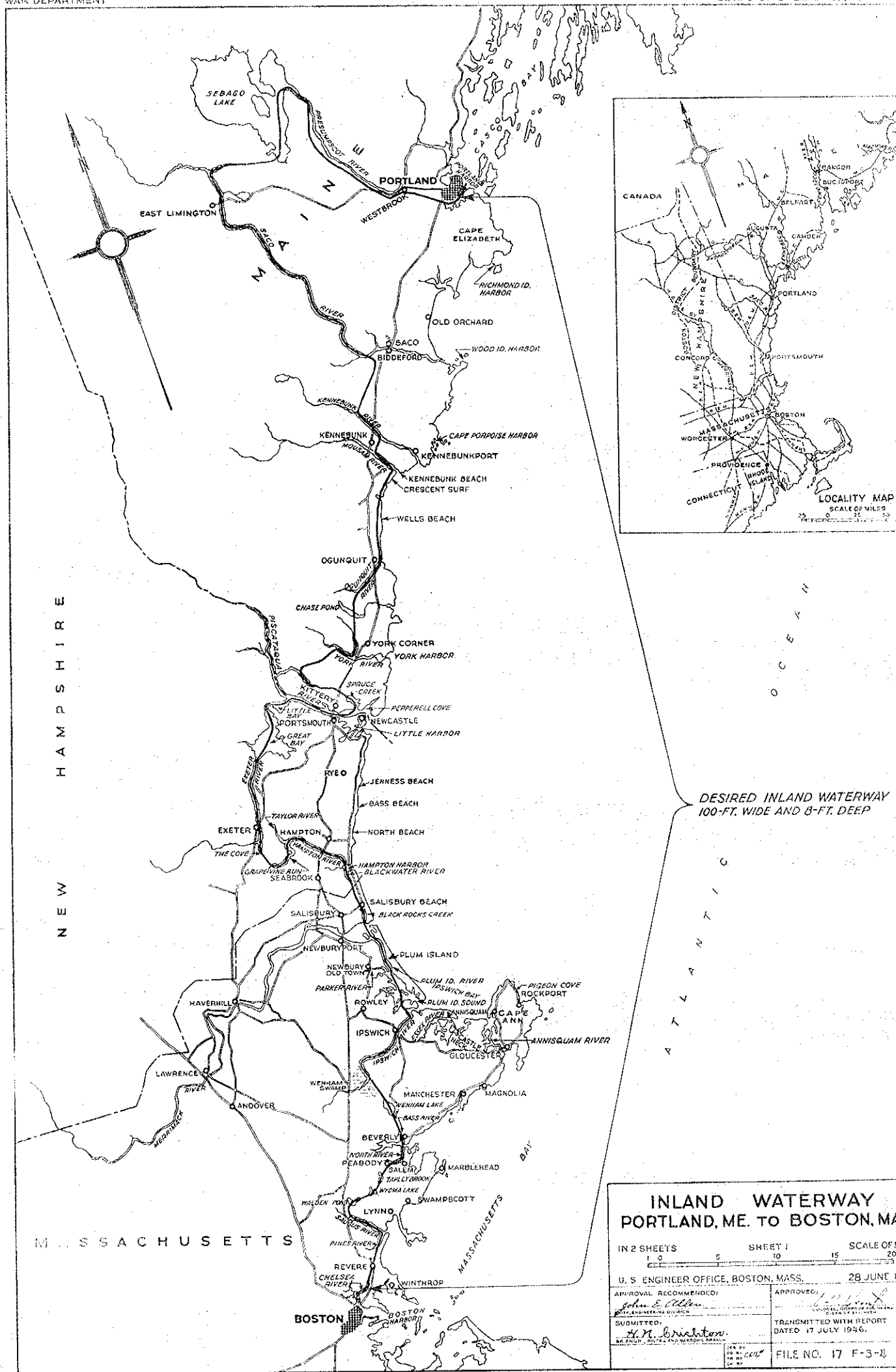
AUG 2 1946  
827 (City of Portland, Me. to Boston and Plum Island Sound to Annisquam R.)



AUTHORITY — THIS REPORT IS  
SUBMITTED IN COMPLIANCE WITH  
SECTION 6 OF THE RIVER AND  
HARBOR ACT, APPROVED, 2 MARCH,  
1945.

U.S. ENGINEER OFFICE  
BOSTON, MASS.  
17 JULY 1946.

COPY NO. 10



SUBJECT: Preliminary examination of a Continuous Waterway between Portland, Maine and Boston, Mass., Inland where Possible, and a Waterway from Plum Island Sound to the Annisquam River, Essex County, Mass.

NEDGW  
(17 Jul 46)

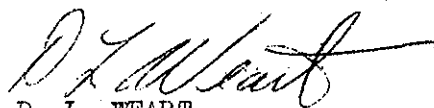
1st Ind.

CAT/bl

Division Engineer, New England Division, Boston 10, Mass., 25 Jul 1946

TO: Chief of Engineers, U. S. Army, Washington 25, D. C.  
ATTENTION: ENGR

I concur in the unfavorable recommendation of the District Engineer.

  
D. L. WEART  
Brigadier General, U.S.A.  
Division Engineer

1 Incl. - n/c

PRELIMINARY EXAMINATION OF INLAND WATERWAY FROM PORTLAND TO  
BOSTON, AND FROM PLUM ISLAND SOUND TO ANNISQUAM RIVER,  
ESSEX COUNTY, MASS.

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Syllabus

The district engineer is of the opinion that the cost of constructing an inland waterway from Portland, Maine to Boston, Mass. would be far in excess of the benefits resulting from the improvement. He also believes that the benefits for a waterway between Portsmouth, N. H. and Gloucester, Mass. or for a waterway from Plum Island Sound to the Annisquam River would not be of sufficient magnitude to warrant further investigation. He therefore recommends that no survey be made, either of a continuous waterway between Portland, Maine and Boston, Mass., inland where possible, or of a waterway from Plum Island Sound to Annisquam River, Essex County, Mass.

War Department,  
United States Engineer Office,  
Boston 16, Massachusetts,  
17 July 1946.

Subject: Preliminary examination of a Continuous Waterway between Portland, Maine and Boston, Mass., Inland where Possible, and a Waterway from Plum Island Sound to the Annisquam River, Essex County, Mass.

To: The Chief of Engineers, U. S. Army, Washington, D. C., through the Division Engineer, New England Division, Boston 10, Mass.

1. Authority.- This report is submitted in compliance with Section 6 of the River and Harbor Act approved 2 March 1945 (Public Law No. 14 - 79th Congress), which reads in part as follows: .

"Sec. 6. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following-named localities, . . . . .  
For a continuous waterway between Portland, Maine, and Boston, Massachusetts, inland where possible . . . . . and a  
Waterway from Plum Island Sound to the Annisquam River, Essex County, Massachusetts."

Since the waterway from Plum Island Sound to Annisquam River, Mass. would, in all probability, form a part of any continuous waterway from Portland, Maine to Boston, Mass., it was deemed advisable to consider both subjects in this report.

2. Description.- The section of the Atlantic coast between Portland, Maine and Boston, Mass. has numerous well known summer resorts, beaches,

recreational areas and yachting centers. In addition to the large coastwise commerce, there is considerable small boat activity along the coast, and in normal times many regattas and cruises are held during the summer season. While there are many good harbors for small vessels in this region, a number of them are partially obstructed by sand bars, with the result that entrance in bad weather is both difficult and dangerous.

3. Portland, Maine is located about 100 miles northeast of Boston, Mass. and is the most important harbor north of Boston. It is situated at the west end of Casco Bay, about 3-1/2 miles from the ocean. It may be approached by four channels located between outlying islands. The main ship channel, which is the most southerly, can be used by vessels drawing up to about 35 feet at low water. The harbor is commodious and has facilities for accommodating all types of vessels from the smallest up to large ocean going ships.

4. The stretch of coast from Cape Elizabeth, about 5 miles southeast of the harbor, extending about 37 miles in a generally southwesterly direction to Portsmouth, N. H. is rocky with but few harbors indenting it. The first of these, about 3 miles from Cape Elizabeth, is Richmond Island Harbor, a harbor of refuge for small craft formed by Richmond Island and a breakwater connecting the island with the mainland. Seven miles farther to the south Wood Island Harbor, eastward of the entrance to Saco River, provides anchorage for small and moderate sized vessels.

5. Cape Porpoise Harbor lies about 7 miles to the southwest of Wood Island Harbor and affords a harbor of refuge for small vessels. Kennebunk River, about 3 miles southwesterly, can be used by small draft boats only, because of a bar at the entrance and then only by those acquainted with local conditions. From the Kennebunk River to York Harbor, a distance of 15 miles, there is no refuge for small vessels in bad weather. York Harbor, a town and summer resort on the north side of York River, has anchorage for a limited number of vessels. Four miles southwest of York Harbor, at the entrance to

Portsmouth Harbor, is Pepperell Cove which is used by many small coastal vessels and yachts as an overnight anchorage. Little Harbor, on the west side of the entrance to Portsmouth Harbor, has an anchorage area 6 feet deep at mean low water.

6. Portsmouth Harbor is the only harbor of refuge for large draft vessels between Portland, Maine and Gloucester, Mass., 25 miles to the south of Portsmouth. Kittery, Maine, on the north side of Piscataqua River opposite Portsmouth, has facilities for accommodating small craft. From Portsmouth Harbor entrance to Hampton Harbor, a distance of about 10 miles, the coast has a generally southwesterly trend, with no marked indentations. It consists of a series of sand beaches separated by ledges extending out about one-half mile from the shoreline. Hampton Harbor, or Hampton River, used only by very small craft, has a dangerous bar at its entrance. From Hampton Harbor to the entrance of the Merrimack River, about 4 miles to the south, the coast is known as Salisbury Beach.

7. The entrance to the Merrimack River is obstructed by a shifting bar which is dangerous and difficult to cross in bad weather. Small craft can enter only with a fairly smooth sea. From the Merrimack River south, the coast is made up of sand dunes for a distance of about 7-1/2 miles to the entrance of Plum Island Sound and the Ipswich River. Plum Island Sound and Plum Island River extending through the marshes from the Merrimack River to the Ipswich River are the approaches to several small rivers and villages, and are frequented by many small craft. The entrance to Ipswich River is obstructed by a sand bar having a usual depth of about 3 to 5 feet at mean low water.

8. Ipswich Bay, the bight between Plum Island Beach and Cape Ann, is the approach to the Ipswich, Essex, and Annisquam Rivers. Essex River has a shifting sand bar at its entrance with depths of about 3 to 4 feet at mean low water.

9. The Annisquam River is a thoroughfare leading from the eastern part of Ipswich Bay north of Cape Ann to Gloucester Harbor on the south side of the

Cape. It has a depth of 10 feet on a bar at the north end and from inside the bar to Gloucester Harbor there is a depth of 8 feet at mean low water. The bar cannot be crossed in a heavy sea. The channel is narrow and crooked but it is much used by small craft.

10. From the entrance of Annisquam River around Cape Ann to Gloucester Harbor the coast is rocky and has only two protected areas for small boats. One of these, Pigeon Cove, is a small cove protected by a breakwater and having depths of 3 to 10 feet. The other and larger is Rockport Harbor which has anchorage space for yachts and small craft, and facilities for providing provisions.

11. Gloucester Harbor is one of the most important fishing ports in the United States and is an important harbor of refuge. There is an outer and an inner harbor, the former with a general depth of 24 feet and the latter from 10 to 24 feet. Magnolia Harbor, a cove about 1.5 miles westward of the entrance to Gloucester Harbor, is a prominent summer resort, and while the harbor is used by many small craft, the holding ground is not good and the cove is exposed to southerly weather.

12. Eleven miles southwestward of Cape Ann and 12 miles northeastward of Boston is a large indentation in the coast which includes the harbors of Manchester, Beverly, Salem and Marblehead. Manchester Harbor is about 5 miles westward of Gloucester Harbor and has supplies and fuel available for small craft, of which a large number frequent the harbor. Salem Harbor is considerably used as a harbor of refuge in addition to having a good deal of commercial activity, as does Beverly Harbor. Marblehead Harbor has an excellent anchorage and is one of the most important centers for yachting along the coast. Between Marblehead Harbor and Boston Harbor the only shelter for small craft is in Lynn Harbor, and this is not greatly used by yachts.

13. Boston Harbor, the most important harbor along the New England coast, is well protected and has been extensively developed for water transportation. The approach to the harbor is through three improved entrance chan-

nels, the largest of which has a depth of 40 feet at mean low water. There are ample anchorage areas within the harbor limits for small draft vessels, and full facilities for providing for the requirements of all types of vessels.

14. The mean range of tides at Portland, Maine, Portsmouth, N. H. and Boston, Mass. are 8.9, 7.8, and 9.6 feet respectively. The improvement under consideration in this report would not result in any shoreline changes nor would it involve any question of land reclamation, water power, flood control, or other special subjects. The locations of the various harbors described above are shown on United States Coast and Geodetic Survey Charts Nos. 1204, 1205, 1206 and 1207, and on the maps accompanying this report.

15. Tributary area.- The area from Portland, Maine to Boston, Mass. includes one of the most important recreational areas along the New England coast and the inland tributary area is made up of the more important manufacturing cities. There are large centers of population within easy traveling distance of the coast where there are numerous resort areas as well as many sections made up of fine summer homes and estates. In addition to those drawn from the surrounding area, there are many vacationists from other parts of the country. Some of the better known resorts and beaches are Kennebunk, Wells, Old Orchard, Ogunquit, York, Rye, Hampton, Salisbury, Marblehead, Swampscott, Revere and Winthrop. There is considerable interest in yachting and recreational boating during the summer months. Most of the waterborne commerce arising from the industrial development of New England passes through the ports of Portland and Boston. Large naval installations are located at these ports, and also at Portsmouth, N. H. Gloucester is one of the largest fishing ports in the country.

16. Bridges.- A continuous inland waterway from Portland, Maine to Boston, Mass. extending over a distance of about 180 miles, would involve construction of some new bridges, both highway and railroad, and the alteration of many existing bridges. Along the suggested route the waterway would be



crossed by 92 roads and highways and 14 railroads. A waterway paralleling the coast at a short distance inland from Portsmouth, N.H. through Plum Island Sound to the Amisquam River would be crossed by 24 roads and highways. While some relocation of roads might be possible, it would still be necessary to provide new bridges with suitable draw openings at most of these crossings.

17. Prior reports.- There have been no prior reports either on a continuous waterway between Portland, Maine and Boston, Mass., inland where possible, or on a waterway from Plum Island Sound to Annisquam River, Essex County, Mass. There have been, however, a few examinations and reports on various routes that might be incorporated as a part of any continuous waterway.

18. In 1920 a preliminary examination was made of a waterway connecting Merrimack River, Mass. and Piscataqua River, N. H. and two routes were considered. One, which was located just inside the coastline, offered the least difficulty to construction, having no cut greater than 20 feet and being 19 miles long, lying largely in swamp. The other route turned west at the Taylor River which it followed for some distance before cutting across to the Exeter River and Great Bay. While this route was shorter it involved a cut of over 80 feet, probably largely in ledge, and would require a sea level canal, as insufficient water supply was available to supply a lock canal. Neither route was recommended and no survey report was made.

19. A survey and report was made in 1937 on the improvement of Plum Island and Parker Rivers, Mass. The report considered the dredging of a channel in Plum Island River from the Merrimack River to Plum Island Sound. The desired improvement was not found to be economically warranted at that time, and was not recommended.

20. A survey and report on an inland waterway between Merrimack River, Mass. and Hampton Harbor, N. H., by way of Black Rock Creek and Blackwater River was made in 1939. No project was recommended as the cost of the improvement was not found to be economically justified.

21. Terminal and transfer facilities.- The proposed continuous waterway from Portland, Maine to Boston, Mass. would connect the harbors at Portland,

Portsmouth, Newburyport, Beverly and Boston. It is believed that these ports have adequate terminal facilities to accommodate whatever traffic might result from construction of the waterway.

22. Improvement desired.- A public hearing was held at Newburyport, Mass. on 22 March 1946 to obtain information in connection with the desired improvement. The hearing was well attended. Among those present were a large number of local and state officials. The National River and Harbor Congress, the Seacoast Regional Development Association of New Hampshire, the Department of Public Works, Commonwealth of Massachusetts, the Propeller Club of the United States, and the American Power Boat Association were among the interests represented.

23. The improvement desired by the proponents is an inland waterway between Portland, Maine and Boston, Mass. If this is not found possible, they desire to have constructed that portion of the waterway extending from Portsmouth, N. H. through Plum Island Sound to the Annisquam River. While the proponents had no definite width or depth of the waterway in mind, the general feeling was that a width of 90 to 100 feet and a minimum depth of 8 feet would be suitable.

24. The representative of the Atlantic Deeper Waterways Association presented a large map upon which was indicated the general route of a continuous inland waterway from Portland to Boston. This route is shown on the map accompanying this report. The representative stated that it was presented to indicate that an inland waterway is both feasible and practical. He further stated that while the proponents desired the entire waterway, they were not asking that the entire project be authorized at one time, but rather that sections of it be considered and constructed as parts of the whole plan.

25. There was great unanimity among those present concerning the desirability of the waterway. Representatives of a number of the cities and towns along the route appeared and went on record as being in favor. This was especially true of the section from Gloucester to Portsmouth, with each

speaker expressing the opinion that the improvement would be of great value to recreational boating, fishing and commerce along the coast.

26. It seemed to be the opinion of everyone that a waterway, a short distance from and paralleling the coast, from the Annisquam River through the Plum Island Sound to the Merrimack River, and thence to Hampton Harbor and Portsmouth Harbor, could be constructed at a reasonable cost and should be the section to be constructed first. Such a waterway would permit traveling from Gloucester, Mass. to Portsmouth, N. H. along a protected route. It was brought out that the bars at the entrances to the Annisquam, Essex, Ipswich, Merrimack and Hampton Rivers were extremely dangerous and hazardous to cross in bad weather, and impassable in severe storms.

27. The representative of the Massachusetts State Department of Conservation outlined the work already done by the Commonwealth at Salisbury Beach and stated that it was expected that about \$1,000,000 would be spent in further improvements. The presence of a waterway in this area would be mutually advantageous.

28. Although great enthusiasm for the project was displayed by those in attendance, nothing substantial was offered in the way of local cooperation towards the cost of the project. Some small disposal areas were mentioned as probably being available, but no cash contribution appeared to be in prospect.

29. Commerce and vessel traffic.— There is at present no commerce or vessel traffic along the desired route. In view of the lack of reliable data concerning the prospective use of the improvement, at least insofar as commerce is concerned, no satisfactory estimate can be made. The commerce and vessel traffic at Gloucester, Newburyport and Portsmouth are shown in the following tables. A large part of the traffic of vessels eight feet or less in draft would, in all probability, avail themselves of the protection of an inland waterway between these points.

### GLOUCESTER

30. The principal commodities which make up the waterborne commerce of Gloucester are fish, coal and oil. The tonnages handled at this port during the past ten years are as follows:

<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>
1936	64,609	1941	119,445
1937	64,276	1942	117,227
1938	70,760	1943	117,664
1939	81,948	1944	121,821
1940	96,531	1945	135,685

31. No complete records are available for detailed tabulation of drafts and net registered tonnages. The harbor is a fishing port visited in 1945 by small motor vessels, with drafts ranging from 6 to 15 feet. The harbor was also visited during the year by towed barges carrying coal, drawing 16 to 18 feet, and by motor vessels with drafts of about 11, 12, and 15 feet, carrying fuel oil.

32. Arrivals in 1945 included 10 towed barges. Fish was delivered in about 4,984 trips of small motorboats. Thirty motor vessels were in foreign trade. The vessel traffic of Annisquam River, a tributary of the harbor, also accounts for many vessels in transit.

### NEWBURYPORT

33. Sand was the only commodity making up the waterborne commerce of Newburyport in 1945. The tonnages handled at this port during the past ten years are as follows:

<u>Year</u>	<u>Vessel traffic (tons)</u>	<u>Additional traffic (1) Cargoes in transit (tons)</u>
1936	20,702	29,600
1937	31,156	30,530
1938	11,196	28,128
1939	12,672	39,134
1940	13,079	32,600
1941	11,666	38,740
1942	(2)	22,685
1943	(2)	22,977
1944	(2)	30,776
1945	(2)	12,748

- (1) Traffic of Merrimack River.  
(2) No freight reported.

# PORTSMOUTH

34. The principal commodities which make up the waterborne commerce of Portsmouth are coal and oil. The tonnages handled at this port during the past 10 years are as follows:

Year	Tons	Passengers	Additional traffic (1) Cargoes in transit (tons)
1936	325,587	10,151	
1937	358,300	8,136	
1938	337,455	6,962	
1939	418,043	8,074	
1940	405,558	8,212	
1941	571,828	7,392	
1942	203,747	(2)	
1943	200,566	(2)	
1944	231,301	(2)	
1945	231,346	(2)	4,794 (3)

- (1) Traffic to Newington.  
 (2) No passengers reported.  
 (3) First year of record.

## Trips and Drafts of Vessels

<u>INBOUND</u>					<u>OUTBOUND</u>			
Draft (feet)	(1) Steamers	Motor Vessels	Barges	Total	(1) Steamers	Motor Vessels	Barges	Total
26 to 28	2	1		3				
18 to 20	1			1				
16 to 18	4		30	34	2	1		3
14 to 16		8	28	36				
12 to 14		52	36	88				
Under 12		284		284	5	344	94	443
Total	7	345	94	446	7	345	94	446
Total net registered tonnage	13,986	103,244	52,358	169,588	13,986	103,244	52,358	169,588

Passengers (2)

- (1) Includes 5 steamships of foreign registry.  
 (2) No passengers reported.

Note: The cessation of service by the Piscataqua River Towing Co. to the Isle of Shoals for the duration of the war is responsible for the absence of passenger traffic and, in part, for the decline in vessel traffic.

35. Difficulties attending navigation.-- The principal difficulty attending navigation between Portland and Boston is connected with the lack of suitable harbors of refuge during stormy weather. This is especially true of the section between Portsmouth and Gloucester where even small boats find it difficult and dangerous to secure shelter in the various rivers such as Annisquam, Essex, Ipswich, Merrimack and Hampton, due to the formation of sand bars at their mouths.

36. Discussion.-- A continuous waterway between Portland, Maine and Boston, Mass. would provide another link in the intracoastal waterway system and serve as a connection between the three most important ports in New England -- Boston, Mass., Portsmouth, N. H. and Portland, Maine. It would pass through a very popular recreational area and by-pass a portion of coast noted for its heavy swells and rough water, especially during stormy weather.

37. The route suggested by the proponents, shown on the accompanying maps, begins in Fore River, Portland Harbor, and runs northwest into the valley of the Presumpscot River at Westbrook, Maine and thence parallel to the river to Sebago Lake, which has an elevation of 262 feet above sea level. The route then crosses the country to the west rising to an elevation of 400 feet enroute to the upper Saco River, which it enters about 3 miles above East Lemington and continues down the Saco River to just above the lower power dam at Saco-Biddeford. There are six power dams on the Saco River which would require the construction of navigation locks and the blasting of channels.

38. Leaving the Saco River at Biddeford, the route crosses to the Kennebunk, rising to an elevation of 120 feet at about the halfway point and then falling to elevation 100 at the Kennebunk, which it enters about 7 miles above its mouth. The Kennebunk would be followed downstream for 2 miles and then the route would cut across country to the Mousam River, 2 miles away, which it would enter just below the town of Kennebunk. The Mousam River would be followed downstream 2.5 miles to sea level at Kennebunk Beach near the mouth of the river.

39. The section of the waterway from Portland to the Mousam River at Kennebunk Beach described above, would be about 70 miles long and would be entirely inland, while the distance by sea between these points is only about 30 miles. Even at Kennebunk Beach it would be necessary to dredge a channel to the sea as there is no entrance possible at the present time from the Mousam River. There would be 42 roads and highways and 6 railroads crossing the waterway in this 70-mile distance, and it is estimated that about 41 locks would be required. In some sections the supplying of water for the locks would present a problem. The benefits to be derived by commerce on this section are small, as there are few communities of any size along the route, and even if there were the commercial use would be problematical because of delays due to locking barges and the fact that during about five months of the year the waterway would be unusable because of ice conditions.

40. As a waterway for recreational purposes, the ice conditions would not be greatly detrimental but the time required to negotiate a 70-mile waterway with numerous locks would, in all probability, prove rather unattractive for yachts and recreational boats desiring to go the 30 miles between Kennebunk Beach and Portland. The harbors at Richmond Island, Wood Island and Cape Porpoise along this stretch of coast afford harbors of refuge within reasonable cruising distances for small boats.

41. From tidewater at the Mousam River the suggested route would follow a southwesterly direction at sea level for about 8 miles through tidal marsh areas just inside the shore bank of Crescent Surf, Wells Beach and Ogunquit Beach to the Ogunquit River. Except for one short distance rising to about 40 feet the rest of this stretch is only a few feet above sea level. Four highways leading to the beaches and having heavy traffic in the summer time would cross the waterway. There is no entrance from the sea to the Ogunquit River. South of the Ogunquit River to Portsmouth Harbor the territory is rocky and made up of numerous knobs and hills over 100 feet high interspersed with many swamps, especially in the southern section of the area. The water-

way would turn inland across this country following the Ogunquit River and several brooks and creeks, none of which is presently navigable, and crossing two ponds at about elevation 160 and the York River at sea level at a point about 4 miles above its mouth.

42. In the first 11 miles of this stretch of about 19 miles a lock canal would be required, as the ground rises from sea level to about elevation 200 and falls back to sea level again. In the last 8 miles a sea level canal would require a maximum cut of about 40 feet and an average cut of about 20 feet. Eighteen roads and highways and one railroad would cross the waterway in this stretch.

43. There is no industrial development of any importance between the Mousam River and Portsmouth Harbor, and the commercial benefits resulting from the improvement of this section would be negligible. As an inland waterway for recreational purposes the high cost of construction of the waterway involving about 27 locks, many bridges, and ledge excavation for the major portion of the way, would appear to be excessive and the possible benefits would not warrant the expenditure.

44. From Portsmouth Harbor the suggested waterway would be at sea level through the Piscataqua River, Little Bay, Great Bay, and the Exeter River to the town of Exeter, a distance of about 22 miles. An existing project extending from the deep waters of Great Bay to Exeter provides for a channel 40 feet wide and 11 feet deep. No interference from existing bridges would be encountered. The strong currents in the Piscataqua River would detract from an enjoyable passage by small boats. On the other side of Exeter, the Exeter River would be followed a short distance and the direction would turn southeast and follow the Cove Creek, after which it would cut across to the Grape Vine Run, a tributary to the Taylor River, which it would follow until the main stream of the Taylor River is reached. It would go down the Taylor and into the Hampton River to Hampton Harbor. None of these streams is navigable in this section. The high point in this stretch of about 8 miles occurs on the section between the Cove Creek and Grape Vine River, where an



elevation of 40 is reached. Ten highways and one railroad are located along this portion of the waterway which would probably be at sea level.

45. An alternate route between Portsmouth and Hampton, N. H. running parallel to the coast was suggested by various speakers at the hearing. This route would involve cuts of about 20 feet and would be only about 11 miles long, as compared with 27 miles on the section using the Exeter River. It would, however, be crossed by 19 roads leading into Rye, North Beach, Jenness Beach, Rye Beach, Bass Beach, North Beach and Hampton Beach. Some ledge rock would be encountered on either route.

46. From Hampton Harbor to the Merrimack River the route would pass through marshy country a few feet above sea level, by way of Blackwater River and Black Rock Creek, behind Salisbury Beach. It would be crossed by one highway in that distance of about 7 miles. After crossing the Merrimack River a sea level course through Plum Island River is proposed to the southern end of Plum Island Sound, a distance of about 10 miles.

47. From the lower end of Plum Island Sound the suggested route would follow the Ipswich River to the town of Ipswich to which point an existing project provides for a channel 4 feet deep and 60 feet wide. On the other side of the town the Ipswich River would be followed to Wenham Swamp at elevation 30 and thence through Wenham Lake at elevation 60 to Bass River and down the river to sea level at Beverly Harbor, a total distance of about 12 miles. From Beverly Harbor the route continues through the North River to Salem, Peabody and thence to Brown Pond, Wyoma Lake and Walden Pond, all of which are at about elevation 70. From Walden Pond the route would cut across country to the Saugus River which it would follow back to sea level. The suggested waterway would follow the Pines River at sea level behind Revere Beach for about a mile before passing through a 3-mile section at about elevation 20. From this point the route would be on the west side of the Boston & Maine Railroad to Chelsea River and thence to Boston Harbor.

48. The total distance along the route from Plum Island Sound to Boston Harbor would be about 36 miles. Twenty roads and highways, and 4 railroads would cross the route and about 10 locks would be needed. Wenham Lake is the water supply for the city of Beverly, and Walden Pond and Wyoma Lake are part of the municipal water supply for the city of Lynn. The section of the waterway from Beverly Harbor to Boston Harbor would, for about half the length, pass through highly developed industrial and residential districts. However, in view of the excellent highway system connecting these centers and the adequate rail service, it is not believed that a waterway would be used very much for commercial purposes. While three existing bridges over the Chelsea River would not have to be altered to care for small boat traffic, there might be objections to the interference with vehicular traffic caused by frequent opening of the bridges to accommodate water traffic. In addition to heavy costs for lock and bridge construction and bridge alteration, as well as much ledge excavation around Ipswich, the cost of land takings in the southern portion would be considerable and the total cost would be in excess of any benefits to be realized.

49. Most of the speakers at the hearing devoted themselves to advocating a waterway from Hampton Harbor to the Merrimack River by way of the Blackwater River and Black Rock Creek, and to a waterway from the Merrimack River to Gloucester Harbor by way of Plum Island Sound, Essex River and the Annisquam River. Some proponents believed that the waterway should also extend from Hampton Harbor to Portsmouth, N. H. The principal argument advanced for such a waterway was that between Portsmouth and Gloucester there are few harbors to which entrance can be gained by small boats during bad weather.

50. This route would be the same as for the suggested waterway between Portland and Boston, with the exception that at the southern end of Plum Island Sound it would pass through the marshes behind Castle Neck, and a portion of the Essex River to the Annisquam River and Gloucester Harbor. It would be practically at sea level except for about a mile near the Annisquam River, which would involve a maximum cut of about 50 feet, a large part of which would be ledge.

51. Separate reports have been made covering various sections of a waterway between Portsmouth and Plum Island Sound. The first of these was in 1920 when an unfavorable preliminary report was made on a waterway connecting the Merrimack River, Mass. and the Piscataqua River at Portsmouth, N.H. This report took into account the fact that there existed at that time no connection to an intracoastal waterway, either from the Merrimack south or from Portsmouth north. It was not felt that the large expenditure required for construction could be justified by the benefits to be obtained at that time.

52. In 1937 a survey for the improvement of Plum Island and Parker Rivers, Mass. was adversely reported on. A part of the improvement considered consisted of dredging in the Plum Island River to provide an inside connecting channel between Newburyport Harbor and Plum Island Sound large enough to permit passage by boats of light draft at all stages of tide. It was the opinion of the district engineer that while the improvement would be of some benefit to the small craft using the waterway, the benefits would be principally local in character, and that neither the present nor prospective use of this waterway would be sufficient to justify the United States in undertaking the work.

53. In 1939 a survey on an inland waterway between the Merrimack River and Hampton Harbor, by way of Black Rock Creek and Blackwater River was reported on unfavorably. As an individual project, without relation to a general project for an inland waterway along the coast, it was determined that the resultant benefits would be largely local in character and incommensurate with the large cost involved. As cash contributions by local interests were not forthcoming, no project was recommended.

54. Although none of the above sections was found to be justified on its own merits, it is still necessary to consider whether or not these sections, joined together to form a continuous waterway, would warrant further investigation.

55. The principal argument in favor of an inland waterway between Portsmouth and Gloucester is the lack of suitable harbors of refuge between the two

points. Even at the mouth of the Merrimack River, where sufficient depth of channel is available for shallow draft boats, entrance is gained with great difficulty in stormy weather because of the bar which forms at that point. Similar difficulties are encountered at the mouths of the Annisquam, Essex, Ipswich and Hampton Rivers. While dredging has been carried on to provide a channel at most of these locations, experience has shown that project depths are not maintained for any great length of time because of shifting sands. Without providing and maintaining suitable channels from the sea to the waterway at these points, one of the prime objectives to be gained through construction of the waterway would be lost. However, if channels are constructed to provide entrance, the necessity for the waterway is considerably reduced. Since the waterway is desired principally for its value toward recreational and small fishing boats, there appears to be reasonable doubt concerning the amount of use that would ensue if there were frequent points at which refuge could be secured during periods of bad weather. Under normal conditions recreational boatmen prefer to cruise a little off shore rather than along an inland waterway through a swampy country. It is possible that fishermen would utilize the waterway to some extent during stormy weather. In general, the waterway would appear to be more of a convenience than a necessity if suitable entrances are provided at Essex, Ipswich, Merrimack and Hampton.

56. In addition to the benefits to be secured by recreational and small fishing boats from a waterway from Portsmouth to Gloucester, there would be additional benefits to be enjoyed by the local communities along the route. Additional land would become accessible for use as sites for summer homes; local boat builders would have increased demand for their products and could make deliveries without being exposed to bad weather on the open sea; the business of supplying the needs of the yachtsmen would increase; and, in general, the businesses serving vacationists would receive added impetus.

57. It is difficult to estimate what increase, if any, in commerce would result from construction of the inland waterway, but it is not believed

that it would be much. There are not many industrial sections between Portsmouth and Gloucester along the proposed route, and it is doubtful if the existing ones would use the waterway to any great extent, as neither Gloucester nor Portsmouth are favorably located centers for trans-shipment of goods. In addition, ice conditions during the winter would cause interference with traffic for several months.

58. Although the many advocates of the waterway claimed that it would be used to advantage by commercial vessels, the only speaker present who was actually engaged in commercial pursuits was a boat builder from Newburyport who asserted that delivery of completed vessels to Gloucester through the waterway would be both possible and advantageous. No commercial fishermen or fuel dealers were present to advance any assurances that they would use the waterway regularly.


59. While considerable impetus might be given to recreational boating activity, the determination of the amount and value of the benefits to be derived would be conjectural. In spite of the various benefits outlined in the previous paragraphs, it is not believed their aggregate monetary value would be sufficient to offset the large annual costs that would be incurred if construction of the waterway were to be undertaken.

60. A waterway from Plum Island Sound to the Annisquam River would be of little value unless a channel is also provided through the upper reaches of the sound to Merrimack River, as entrance to Plum Island Sound from the sea, even by small boats, can only be gained under the most favorable conditions. Such a waterway would be made up of a channel through the Plum Island River, previously adversely reported upon, plus an extension south to the Annisquam River through marsh areas with the last portion being through comparatively heavy cut, largely in ledge. This extension would be very much more expensive to construct than the Plum Island River section. The added benefits to be secured by having a through waterway from the Merrimack River to Gloucester Harbor would be more than offset by the greatly increased costs of construction, and consequently the improvement is not believed warranted.

61. Conclusion.- The district engineer is of the opinion that the cost of constructing a waterway between Portland, Maine and Boston, Mass. along the route suggested by the proponents would be prohibitive because of the number of locks and bridges required, and the amount of excavation involved, a large part of which would be in ledge. He believes that the waterway would not be greatly used for commercial purposes and most of the benefits resulting from the improvement would be those connected with recreational boating. He does not believe that these benefits are commensurate with the costs, and therefore further investigation is not warranted.

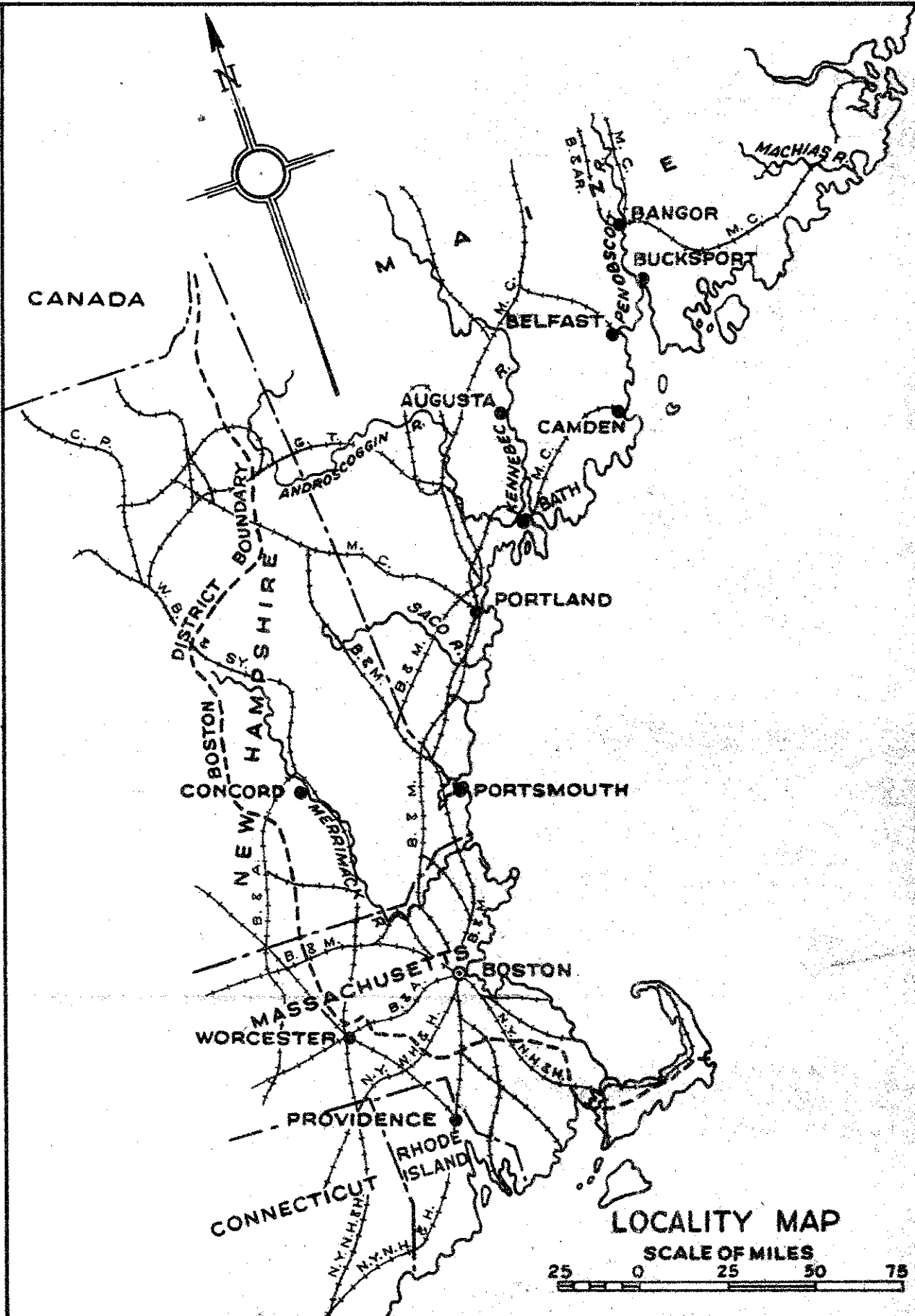
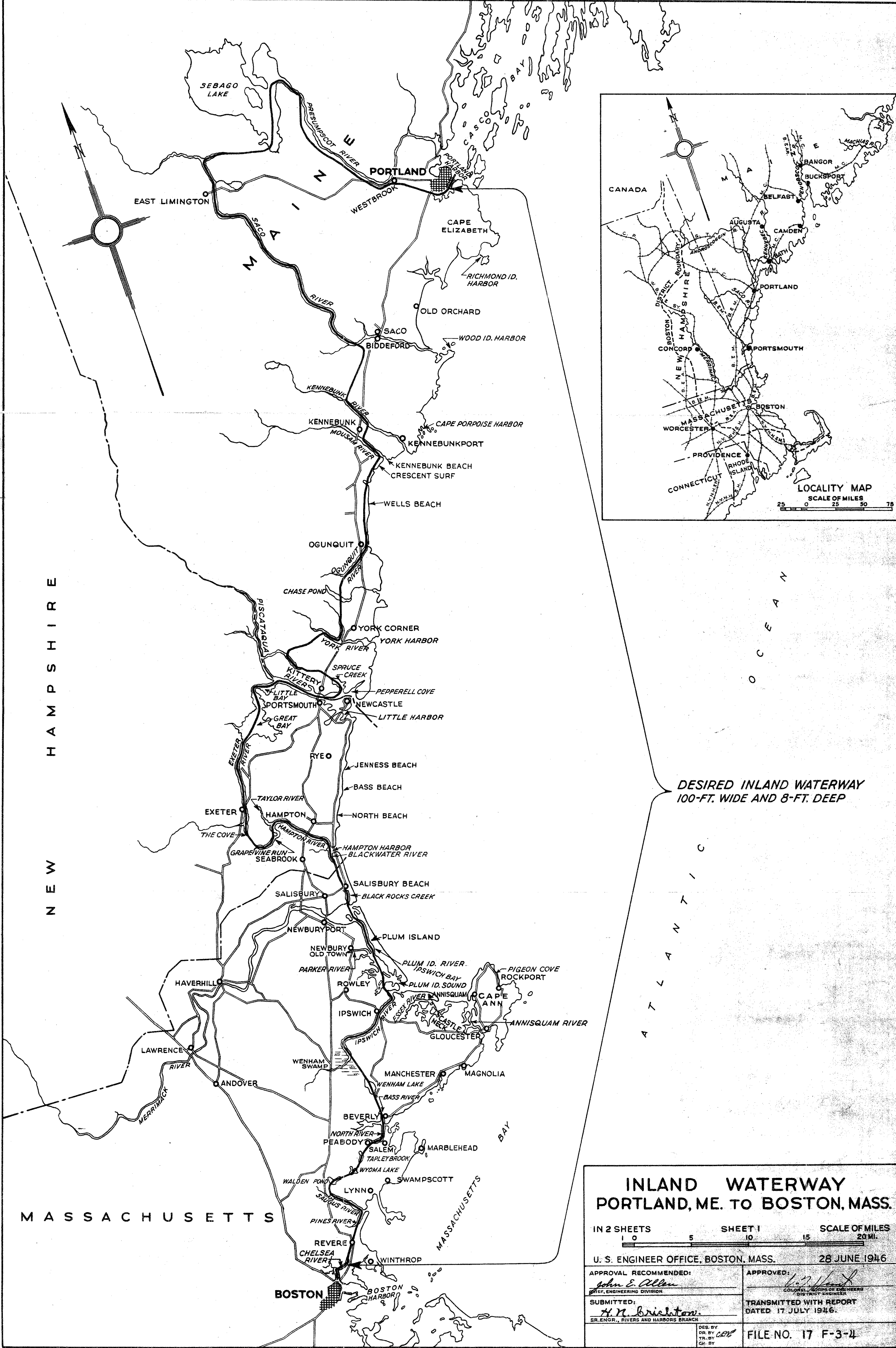
62. He is also of the opinion that although the benefits for a waterway between Portsmouth, N. H. and Gloucester, Mass., or for a waterway from Plum Island Sound to the Annisquam River would show better ratios to costs than for the one from Portland to Boston, they are still of insufficient magnitude to warrant further investigation of either of these routes.

63. Recommendation.- The district engineer recommends that no survey be made, either of a continuous waterway between Portland, Maine and Boston, Mass., inland where possible, or of a waterway from Plum Island Sound to Annisquam River, Essex County, Mass.

  
C. T. HUNT,  
Colonel, Corps of Engineers,  
District Engineer.

Inclosure:  
Map





DESIRED INLAND WATERWAY  
100-FT. WIDE AND 8-FT. DEEP

# INLAND WATERWAY PORTLAND, ME. TO BOSTON, MASS.

IN 2 SHEETS      SHEET 1      SCALE OF MILES  
1 0 5 10 15 20 MI.

U. S. ENGINEER OFFICE, BOSTON, MASS.      28 JUNE 1946

APPROVAL RECOMMENDED:  
*John E. Allen*  
CHIEF, ENGINEERING DIVISION

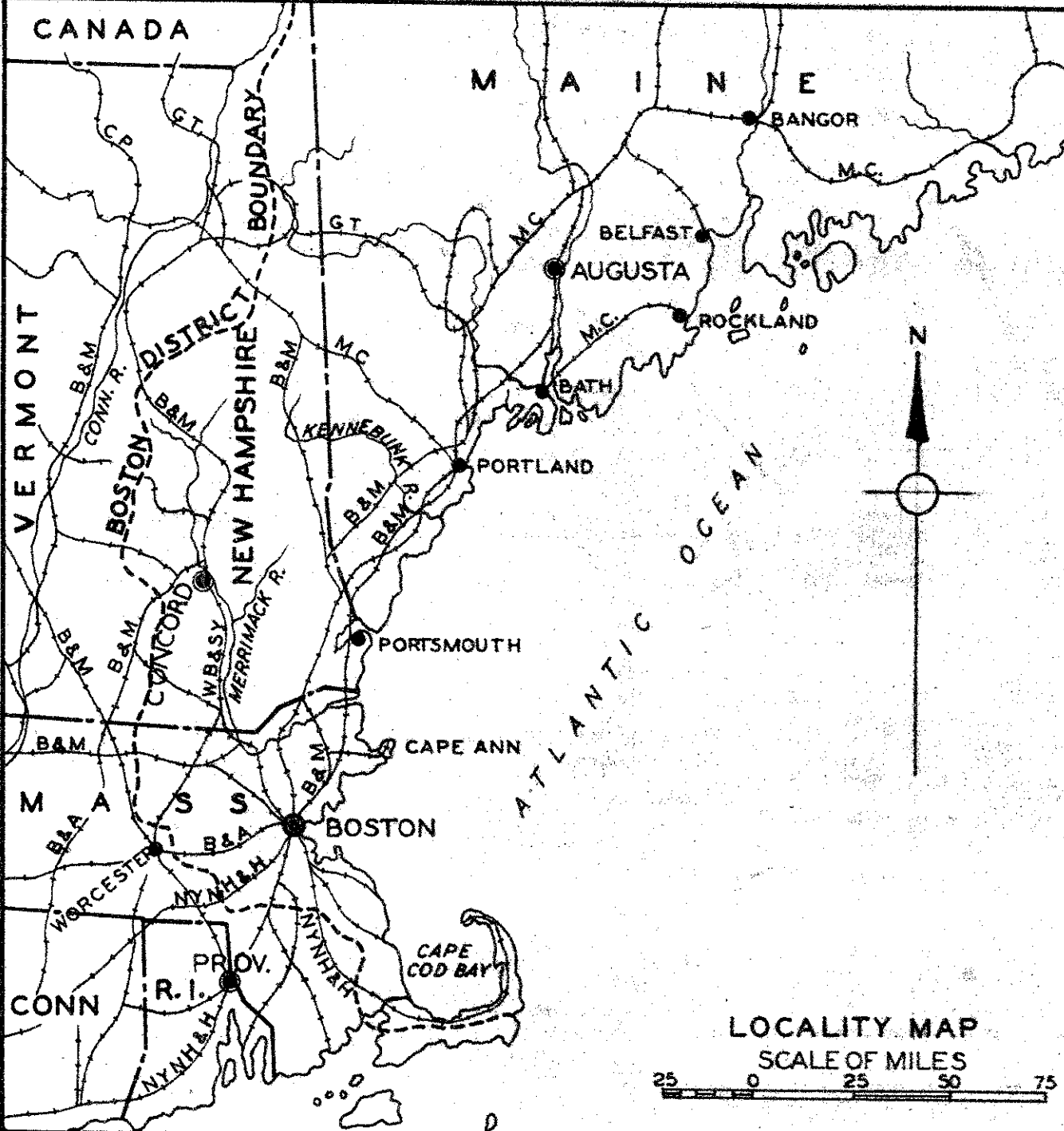
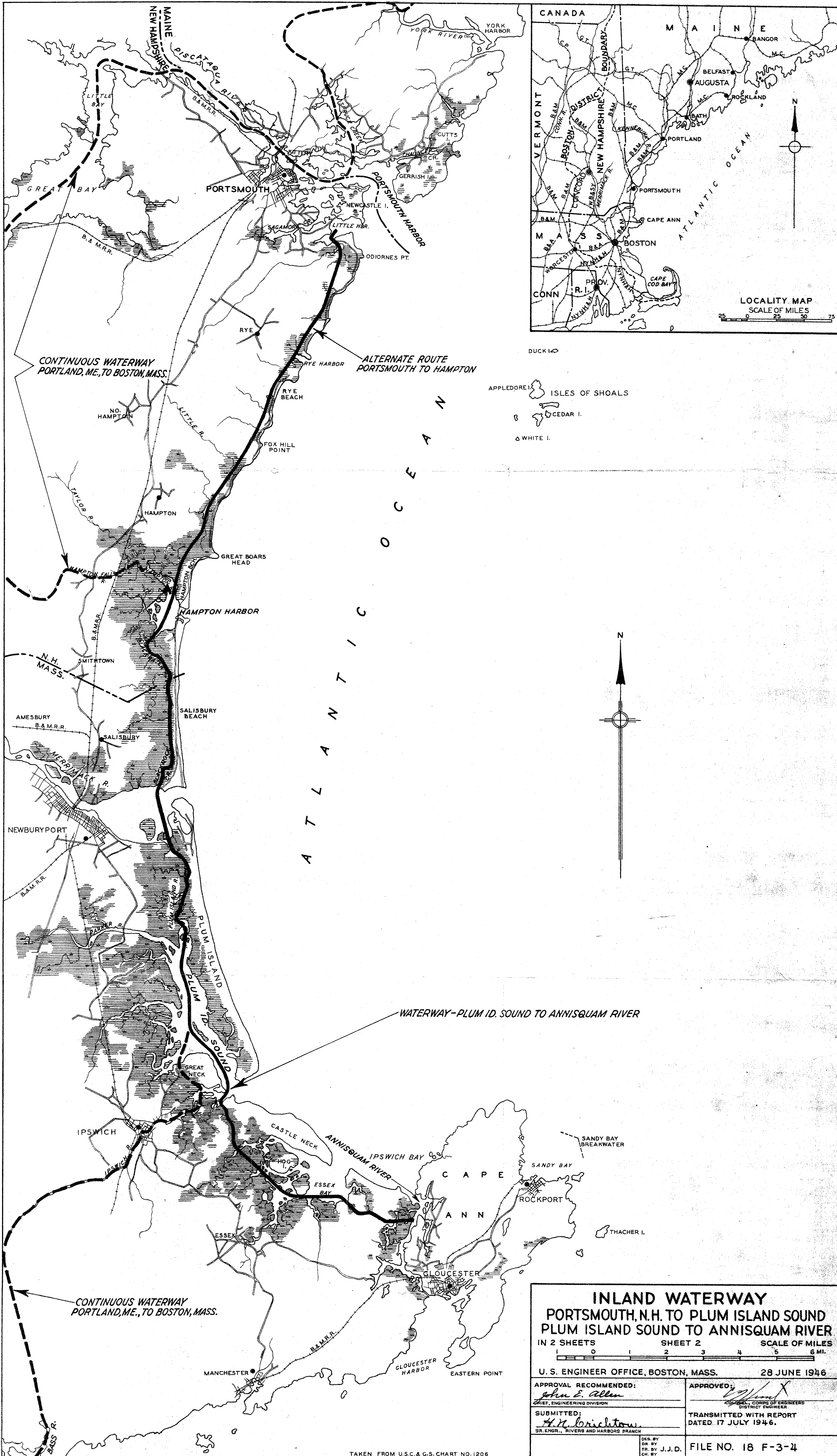
APPROVED:  
*[Signature]*  
COLONEL, CORPS OF ENGINEERS  
DISTRICT ENGINEER

SUBMITTED:  
*H. N. Brislaton*  
SR. ENGR., RIVERS AND HARBORS BRANCH

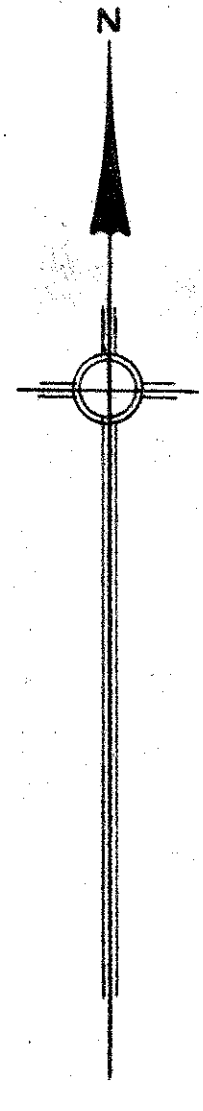
TRANSMITTED WITH REPORT  
DATED 17 JULY 1946.

DES. BY  
DR. BY  
TR. BY  
CH. BY  
FILE NO. 17 F-3-4





- DUCK I.
- APPLEDORE I.
- ISLES OF SHOALS
- CEEDAR I.
- WHITE I.



<b>INLAND WATERWAY</b> <b>PORTSMOUTH, N.H. TO PLUM ISLAND SOUND</b> <b>PLUM ISLAND SOUND TO ANNISQUAM RIVER</b> IN 2 SHEETS      SHEET 2      SCALE OF MILES 1 0 1 2 3 4 5 6 MI.	
U. S. ENGINEER OFFICE, BOSTON, MASS.      28 JUNE 1946	
APPROVAL RECOMMENDED: <i>John E. Allen</i> CHIEF, ENGINEERING DIVISION	APPROVED: <i>[Signature]</i> DISTRICT ENGINEER
SUBMITTED: <i>A. N. [Signature]</i> SR. ENGR., RIVERS AND HARBORS BRANCH	TRANSMITTED WITH REPORT DATED 17 JULY 1946.
DES. BY DR. BY TR. BY J.J.D. CH. BY	FILE NO. 18 F-3-4